Claims 1-12 are pending in the application. Claims 1-12 have been rejected. Claim 1 has been amended.

Applicants respectfully assert that the amendments to the claims and specification add no new matter.

The Telephone Interview

Initially, Applicants wish to thank the Examiner, Dinh Thanh le, for granting and attending the telephone interview, with Applicants' Representative, Vladimir Sherman, Reg. No. 43,116 on August 19, 2002. In the interview, claims 1 and 12were discussed, as was U.S. Pat. No. 6,198,342 to Kawali (the "Kawali reference").

CLAIM REJECTIONS

35 U.S.C. § 112 Rejections

In the Office Action, the Examiner rejected claims 1, 2, 3, 8 and 12 under 35 U.S.C. § 112, second paragraph, as allegedly being indefinite for failing to point out and distinctly claim the subject matter which applicant regards as the invention.

The Examiner's reasons for rejection are as follows:

In claim 1, it is unclear what the "type" on line 1 is.

Claim 1 has been amended to remove the word "type". The Examiner rejection is thus rendered moot.

In claim 2, it is unclear what the "threshold voltage losses" are and where they come from.

The term "threshold voltage losses" may be found in the specification. More specifically, the term may be found on page 6, line 20. Additionally, term "threshold voltage losses" inserted on page 2, line 22, next to the description of the condition the term is meant to categorize. Therefore, Applicants respectfully request that the Examiner withdraw this rejection of claim 2.

In claim 3, it is unclear what the "subset of stages" are and where they come from.

Applicants respectfully wish to point out that the terms "stage" and "stages" are well defined throughout the specification as filed and in the preamble of claim 1. Furthermore, since the preamble of claim 1 has been amended to include "a set of stages" and the term "subset" is well understood in the English language, it should be clear that the phrase "subset of stages" in claim 1 means some number of stages less then the total number of stages in the claimed charge pump. Therefore, Applicants respectfully request that the Examiner withdraw this rejection of claim 3.

In claim 12, it is unclear what the "given stage", "injection capacitor" and "control capacitor" are and how they can be determined on the drawings.

Applicants respectfully wishes to point the Examiner to the specification as filed, for example to page 3, lines 10, 11 and 21, where the terms are defined in reference to a charge pump of the prior art in Fig. 1. Reference numbers for Fig. 1 are attached to the definitions, more specifically: (1) injection capacitors are denoted in the drawings as 360, 370, 380 and 390; (2) control capacitors are denoted as 160, 170, 180, and 190. On page 11, line 11, control capacitors in Fig. 3 are discussed and given the reference numbers 780, 790, 800 and 810. These control capacitors are substantially in the same location and arrangement as corresponding control capacitors in Fig. 1. Applicants, therefore respectfully assert that it would be clear to one of ordinary skill in the art that corresponding structures within Figs. 1, 3 and 5, bear the same names and substantially the same function.

A combination or arrangement of an injection capacitor and a control capacitor form a single "stage" or a "given stage", as defined in the specification and shown in the Figs.

Therefore, Applicants respectfully request that the Examiner withdraw this rejection of claim 12.

In claim 8, it is unclear how the recitation "charge transfer transistor" and "controlling transistor" is read on the preferred embodiment. Insofar as understood, no such means can be determined on the drawings.

Applicants respectfully wishes to point the Examiner to the specification as filed, for example to page 9, lines 20 and 21, where the terms are defined in reference to a charge pump of the prior art in Fig. 3. Reference numbers for Fig. 3 are attached to the definitions,

more specifically: (1) control transistors are denoted in Fig. 3 as 700, 710, 720 and 730; (2) charge transfer transistor are denoted as 740, 750, 760, and 770.

Therefore, Applicants respectfully request that the Examiner withdraw this rejection of claim 8.

35 U.S.C. § 102 Rejections

In the Office Action, the Examiner rejected claims 1-12 under 35 U.S.C. § 102(b), as being anticipated by U.S. Pat. No. 6,198,342 to Kawali (the "Kawali reference").

Amended claim 1 now recites in part "In a charge pump including a first set and a later set of stages... a second clock signal having a second voltage swing greater than the first voltage swing, the second clock signal being applied to the control capacitor of at least one of the stages within the later set of stages. ". Applicant wishes to point out that, in contrast to the claimed charge pump, the Kawali reference discloses a charge pump where a second clock is applied to all the stages of the charge pump. Therefore, Applicants believe claim 1 is now allowable over the Kawali reference. Applicants respectfully request the Examiner to withdraw his rejection of claim 1 and to allow the claim.

Claims 2 through 11 depend from claim 1, and Applicants believe claims 2 through 11 are now allowable by virtue of their dependence on allowable claim 1.

Claim 12 now recites in part "A method for overcoming increasing bulk effect in successive stages of a positive charge pump... applying a comparatively greater voltage to a control capacitor in a successive stage". For the same reasons stated above for claim 1, Applicants believe that claim 12 is now allowable of the cited reference. Applicants respectfully request that the Examiner withdraw his rejection of claim 12 and allow the claim.

In view of the foregoing amendments and remarks, the pending claims are believed to be allowable. Their favorable reconsideration and allowance is respectfully requested.

Should the Examiner have any question or comment as to the form, content or entry of this Amendment, the Examiner is requested to contact the undersigned at the telephone number below. Similarly, if there are any further issues yet to be resolved to advance the prosecution of this application to issue, the Examiner is requested to telephone the undersigned counsel.

Please charge any fees associated with this paper to deposit account No. 05-0649.

Respectfully submitted,

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Dated: August 19, 2002

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

In the Title, the following changes were made:

[EFFICIENT] CHARGE PUMP APPARATUS AND METHOD FOR OPERATING THE SAME

In the Claims, the following changes were made:

1. (Once Amended) In a charge pump including a first set and a later set of stages, each stage comprising an input and an output, an injection capacitor and a control capacitor, an improvement comprising:

(a) a first clock signal having a first voltage swing, the first clock signal being applied to the energy injection capacitor of each of the stages; and

(b) a second clock signal having a second voltage swing greater than the first voltage swing, the second clock signal being applied to the control capacitor of at least one of the stages within the later set of stages.

12. (Once Amended) A method for overcoming increasing bulk effect in successive stages of a charge pump comprising:

[by] applying in a given stage an energizing voltage to an energy injection capacitor[,] ; and

[while] applying a comparatively greater voltage to a control capacitor in a successive stage.